

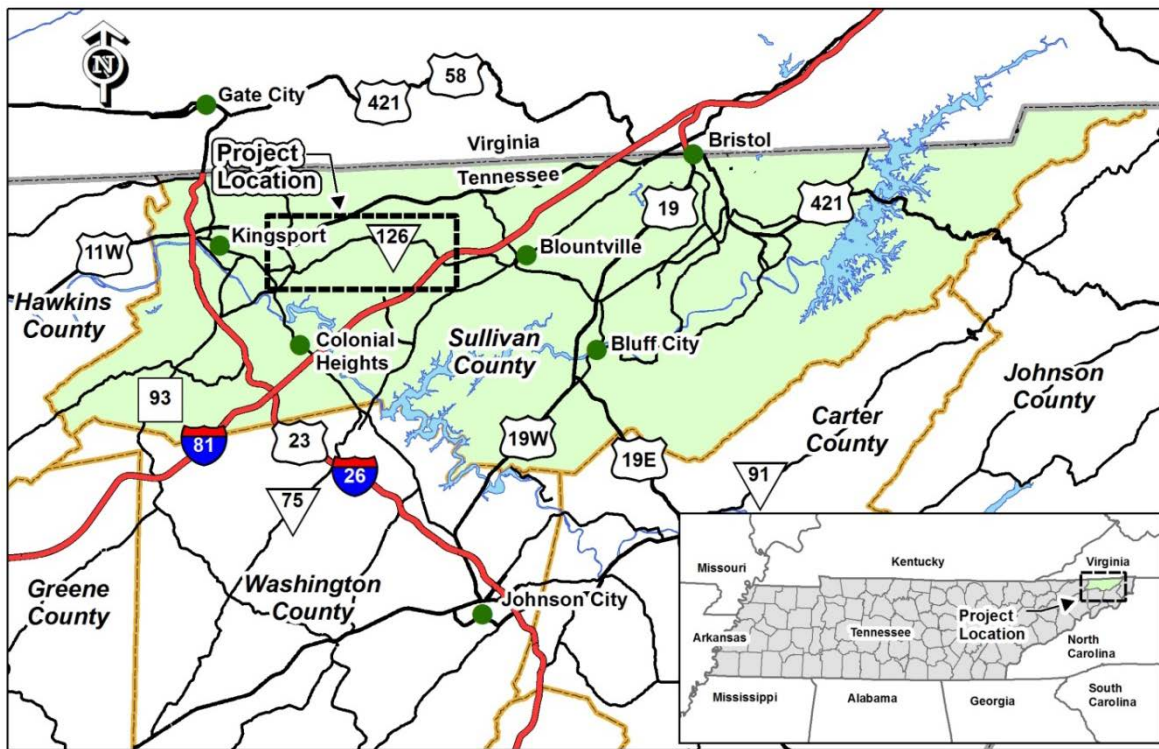
## 1.0 PURPOSE AND NEED FOR ACTION

### 1.1 Introduction

The State Route (SR) 126 (Memorial Boulevard) (SR 126 hereafter) improvement project is a joint effort between the Tennessee Department of Transportation (TDOT) and the Federal Highway Administration (FHWA). The limits of the 8.4-mile-long project extend from East Center Street, within the City of Kingsport's city limits, east to Interstate 81 (I-81) in Sullivan County, Tennessee. Figure 1-1 shows the general vicinity of the project area and Figure 1-2 (on the following page) illustrates the project corridor.

FHWA approved the *Draft Environmental Impact Statement* (DEIS) on January 5, 2012. The DEIS is available in Appendix J<sup>1</sup> to this document or at the TDOT project website <http://www.tdot.state.tn.us/sr126/involvement.shtml>. This document is the *Final Environmental Impact Statement* (FEIS) and summarizes all changes and updates since approval of the DEIS, including further development of alternatives, public involvement, selection of the Preferred Alternative (Alternative B Modified), agency coordination, and proposed mitigation.

**FIGURE 1-1: PROJECT VICINITY MAP**



The proposed SR 126 improvement project is located within the Kingsport Metropolitan Transportation Planning Organization (KMTPO) jurisdiction. Improvements along SR 126 are included in the KMTPO's *2035 Long Range Transportation Plan* (LRTP), dated June 7, 2012, and the KMTPO's Transportation Improvement Program (TIP). The plan addresses the future transportation needs within the KMTPO boundary. Both the TIP and LRTP pages are in Attachment A.

<sup>1</sup>Attachments are appended to the body of this document. Hard copies of the FEIS contain an Appendix CD on the back cover — digital copies have an "Appendix" PDF file.

FIGURE 1-2: PROJECT LOCATION MAP (SHEET 1)

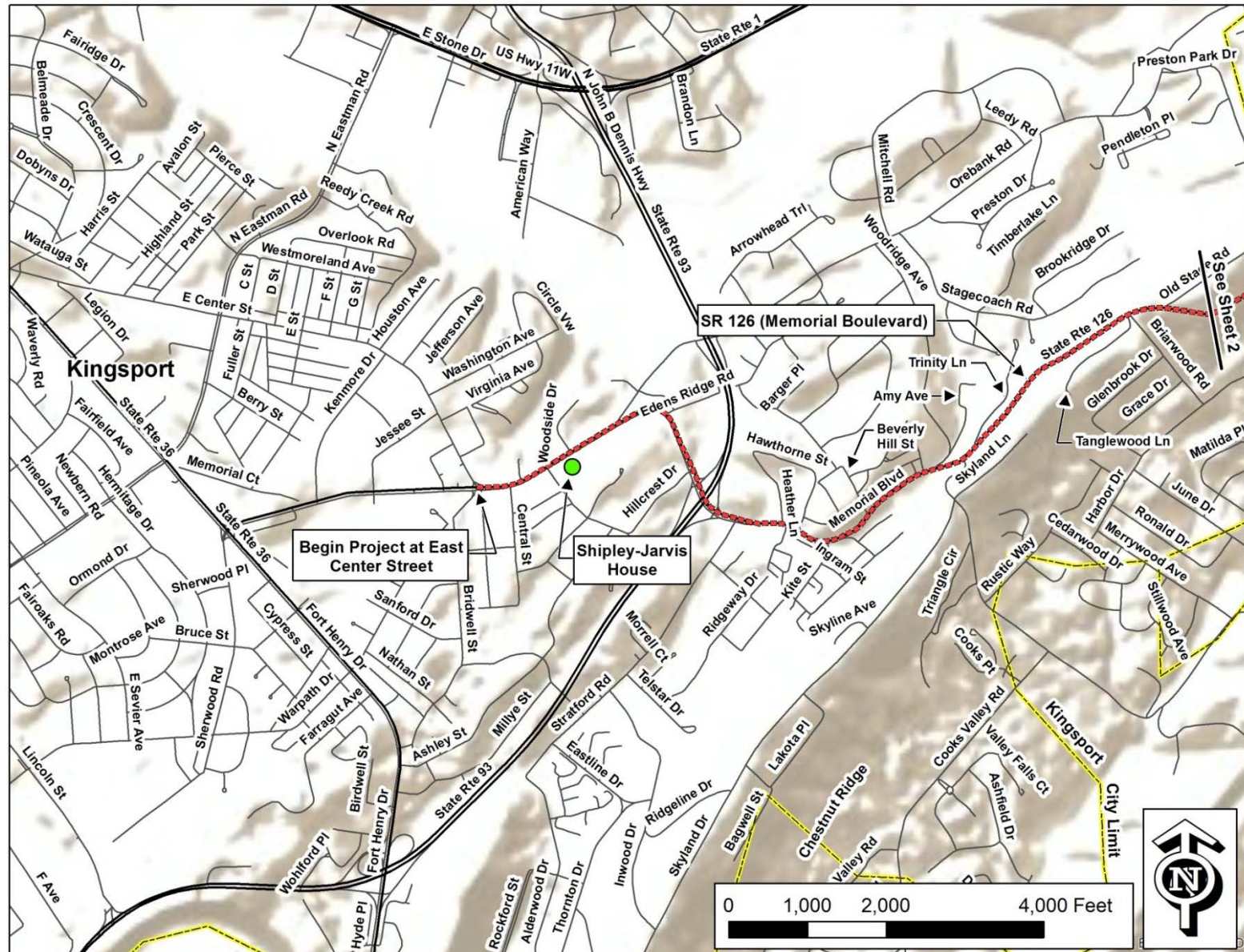




FIGURE 1-2: PROJECT LOCATION MAP (SHEET 2)

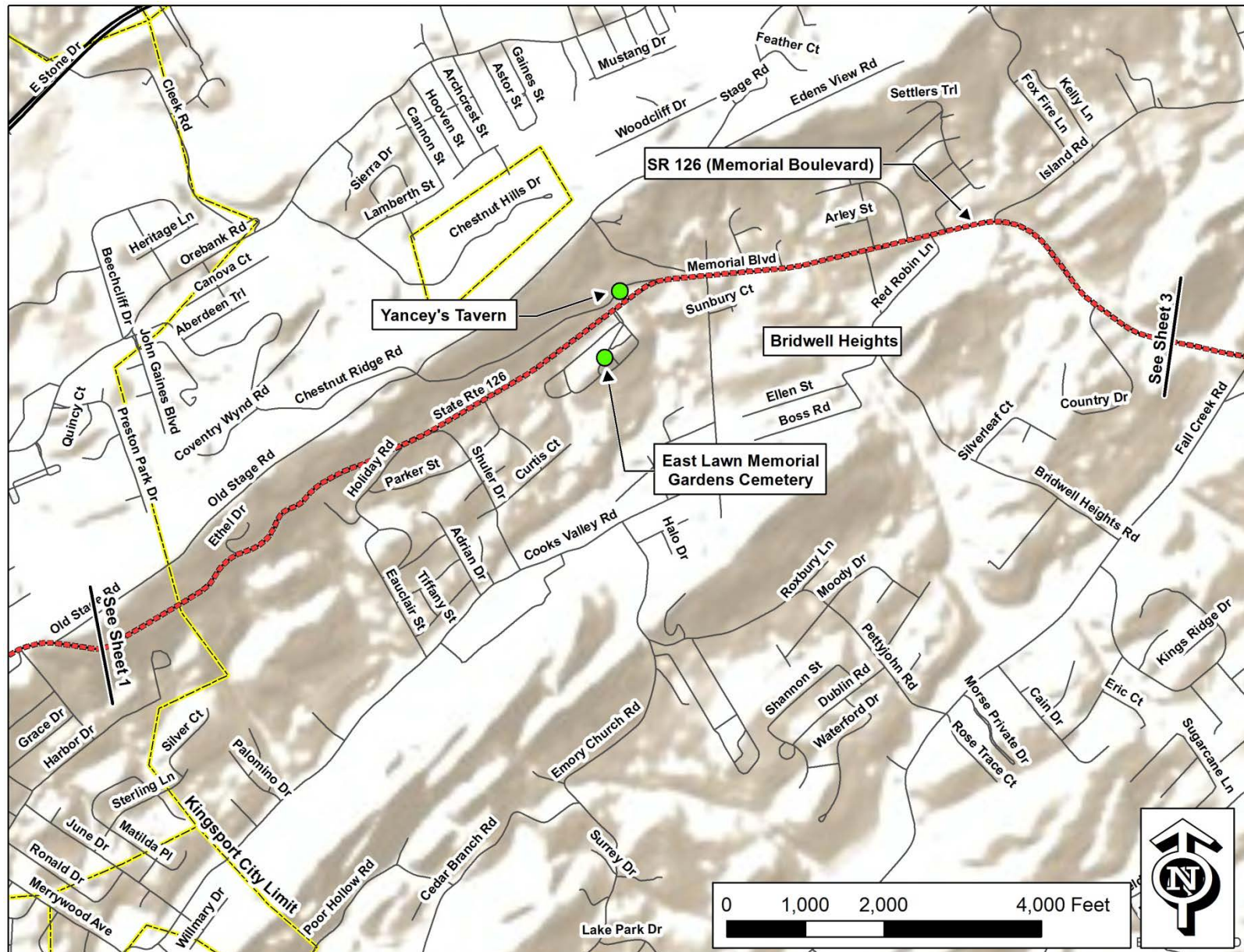
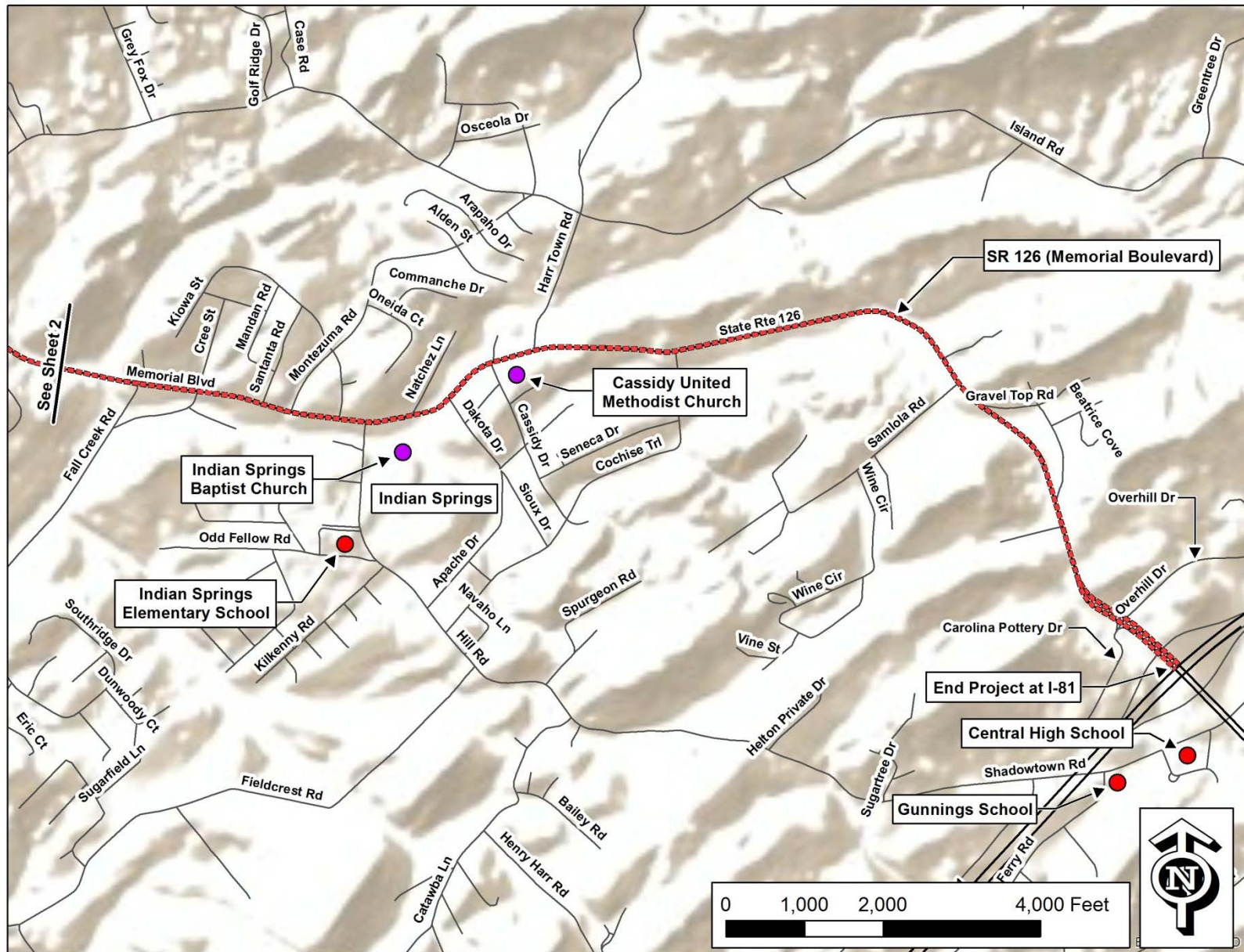




FIGURE 1-2: PROJECT LOCATION MAP (SHEET 3)



## 1.2 Description of the Study Corridor

### 1.2.1 Description of the Adjacent Community

Within the 8.4-mile-long study limits between East Center Street and I-81 the terrain is rolling. Due to the terrain, many side roads intersect SR 126 at skewed angles. Steep side-slopes and guardrails are prevalent among many segments of the corridor. Poor access control is prevalent in the commercial areas with many businesses having their entire frontage paved adjacent to the roadway. A few community resources, including two of historical significance, are located adjacent to the roadway. These resources are the Shipley-Jarvis House, which is deemed eligible for listing on the National Register of Historic Places (NRHP), and Yancey's Tavern, which is listed on the NRHP, and is currently used as a community event and meeting place. The East Lawn Memorial Gardens Cemetery is also very important to the community.

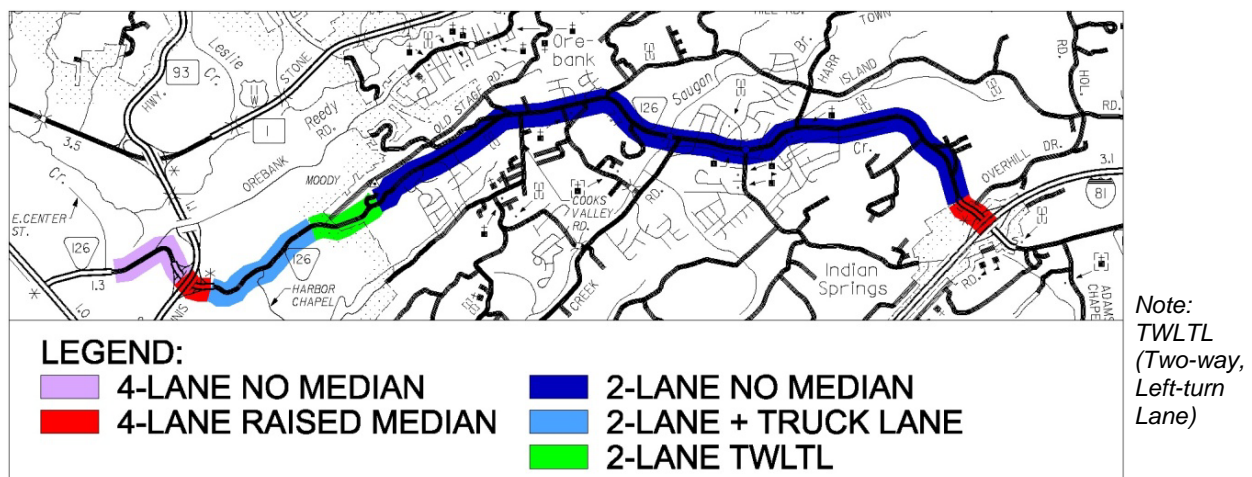
The corridor contains a mixture of land uses, including commercial, residential, and rural. Residential and commercial land use is present from the corridor's western terminus at East Center Street east to Beverly Hill Street. Within this approximately 1.19-mile-long segment, the commercial land uses are generally small, privately owned stores, restaurants, car lots, gas stations, and other service businesses. The residential land use is generally single-family housing. The Shipley-Jarvis House is located adjacent to the eastbound lanes near Woodside Drive in this segment. The residential land use is generally single-family for the next 1.13 miles, from Beverly Hill Street to near Ethel Drive.

The land use is primarily rural for the final 6.08 miles of the corridor, from near Ethel Drive to I-81, though there are some areas of commercial development within this segment. The commercial land uses are generally small, privately owned stores, restaurants, car lots, gas stations, and other service businesses. Yancey's Tavern and the East Lawn Memorial Gardens Cemetery are located on either side of SR 126 near Chestnut Ridge Road in this segment.

### 1.2.2 Existing Roadway Cross-Section

Four travel lanes are present along 13 percent of the corridor and are located at the eastern and western termini. The middle 87 percent of the corridor has two travel lanes (including a 0.90-mile-long truck climbing lane). Sidewalks are present along one percent of the corridor. A shoulder width equal to or greater than four feet, which is generally regarded as the minimum safe width for bicyclists, is present along eight percent of the corridor. The existing right-of-way (ROW) width varies from approximately 60 feet to 160 feet. Figure 1-3 illustrates and Table 1-1 describes the existing roadway features.

**FIGURE 1-3: EXISTING ROADWAY CROSS-SECTION**



**TABLE 1-1: EXISTING ROADWAY DESCRIPTION**

Segment ID	Location	Length (Miles)	Posted Speed Limit	Travel Lanes	Description ROW, Medians, Shoulders, Ditches and Curbs and Gutters (C&G), Sidewalks, Traffic Signals
1	Center St. to West of Hillcrest Dr.	0.61	35	4 lanes vary from 11-11.5 ft. wide	<ul style="list-style-type: none"> <li>- ROW varies (60-90 feet (ft.))</li> <li>- Left turn lane at Center St., median begins at Hillcrest for SR 93 Interchange</li> <li>- Shoulders 2 ft. wide or less (paved, gravel, none)</li> <li>- Vary: ditch only, ditch with C&amp;G, C&amp;G only</li> <li>- Sidewalks for approximately 0.10 miles in the Orebank Rd./Edens Ridge Rd. area</li> <li>- Traffic signal at East Center St.</li> </ul>
2	West of Hillcrest Dr. to between Stratford Rd. and Heather Ln.	0.27	35	4 lanes vary from 11-12 ft. wide	<ul style="list-style-type: none"> <li>- ROW varies (100-160 ft.)</li> <li>- Median ranges 20-28 ft. wide and generally raised with grass; some areas depressed; flush with concrete barrier at SR 93 (John B. Dennis Hwy.)</li> <li>- Shoulders 5-16 ft. wide (generally gravel with some paved areas)</li> <li>- Ditches, ditch with C&amp;G in the SR 93/ Stratford Rd./ Heather Ln. area</li> <li>- No sidewalks</li> <li>- Traffic signals at two SR 93 (John B. Dennis Hwy.) ramp intersections</li> </ul>
3	Between Stratford Rd. and Heather Ln. to between Trinity Ln. and Tanglewood Rd.	0.90	45	3 lanes 11 ft. wide	<ul style="list-style-type: none"> <li>- ROW varies (generally 120 ft.)</li> <li>- No median</li> <li>- Shoulders 1 ft. wide (paved)</li> <li>- Ditches</li> <li>- No sidewalks</li> <li>- Traffic signal at Harbor Chapel Rd.</li> </ul>
4	Between Trinity Lane and Tanglewood Road and between Old Stage Road and Ethel Drive	0.50	45	2 lanes 11 ft. wide	<ul style="list-style-type: none"> <li>- ROW varies (generally 120 ft.)</li> <li>- Two-way center left-turn lane</li> <li>- Shoulders 2 ft. wide (paved, soil and gravel)</li> <li>- Ditches</li> <li>- No sidewalks</li> </ul>
5	Between Old Stage Road and Ethel Drive and west of Carolina Pottery Drive	5.90	50	2 lanes vary from 11-12 ft. wide	<ul style="list-style-type: none"> <li>- ROW varies (60-120 ft.)</li> <li>- Two-way center left-turn lane from west of Kiowa St. to west of Natchez Ln.</li> <li>- Shoulders vary 2 ft. (soil/gravel) to 6 ft. (paved)</li> <li>- Ditches</li> <li>- No sidewalks</li> </ul>
6	West of Carolina Pottery Drive to I-81 Overpass	0.22	40	4 lanes 12 ft. wide	<ul style="list-style-type: none"> <li>- ROW varies (160 ft. max)</li> <li>- Median transitions to 29 ft. raised with grass</li> <li>- Shoulders 12 ft. paved</li> <li>- Ditches</li> <li>- No sidewalks</li> </ul>



### 1.3 Project Background and Status

SR 126 was initially constructed in 1926. The roadway was originally 18 feet wide and constructed of concrete. The roadway was widened to 22 feet in 1950 and overlaid with asphalt. Existing SR 126 follows the original 1926 alignment.

Since the early 1990s, improvements for SR 126 have been discussed that would facilitate improved traffic and safety conditions for the route. The executive board and executive staff of the KMTPO passed a resolution requesting the preparation of an advanced planning report (APR) for SR 126 in March 2003. In April 2003, a copy of this resolution was sent by the Mayor of Kingsport to TDOT. A response from TDOT was provided in May 2003 acknowledging Kingsport's efforts and needs and the resolution was sent to the TDOT Planning Division with instructions to initiate an APR. In September 2003, TDOT responded by selecting the SR 126 project as Tennessee's first to go through the Context Sensitive Solutions (CSS) process.

The purpose of the CSS process was to include community members in the study and preparation of a concept plan to improve SR 126 for recommendation to TDOT. Between October 2003 and May 2005, a Community Resource Team (CRT) was assembled and participated in meetings, CSS training, workshops, and six public involvement sessions. In February 2006, the CSS report for SR 126 was completed and is now on file at the TDOT Environmental Division Office in Nashville. The CSS process determined several "common ground" recommendations with unanimous support among the CRT members. The CRT agreed:

- Safety is the highest priority on this project;
- Impacts should be minimized to protect the integrity of community treasures in the SR 126 study area;
- Enhancement features such as retaining walls, landscape buffers, and decorative guardrail and lighting should be incorporated into the design plans;
- Where roadway widening is undertaken, use as much of the existing roadway as possible and;
- Where the roadway is widened from two to four lanes, consider leaving the existing road in place and constructing the new lanes to one side (asymmetrical widening). Asymmetrical widening should not preclude making improvements to correct horizontal and vertical alignment deficiencies.

Conceptual layouts for three distinct proposals and one blended proposal were prepared by TDOT with input from the CRT. The concepts were originally presented at two public involvement sessions in November 2004. Revised concepts were presented for review and comment at two public involvement sessions in May 2005. The majority of the CRT members supported a blend of roadway cross-sections along the corridor. Alternative A, as described in Chapter 2, represents the recommendations made by the majority of the CRT members.

The report prepared as a result of the CSS process includes three CRT member minority objection statements that addressed specific sections of the project study area. Alternative B, as described in Chapter 2, was developed to address the request to minimize impacts to Yancey's Tavern and the East Lawn Memorial Gardens Cemetery near Cooks Valley Road on opposite sides of SR 126.

The DEIS was approved by FHWA on January 5, 2012. The document discussed the two build alternatives (Alternative A and Alternative B) and the No-Build Alternative at a comparable level of detail. The social, ecological, and cultural impacts for each were presented. Two public hearings were held on December 11, 2012. TDOT presented the results of the alternatives studied in the DEIS along with a modification to Alternative B, which was referred to as “Alternative B Modified”. Alternative B Modified is the result of comments received from the community following the circulation of the approved DEIS for review and an update to the KMTPO Travel Demand Model in the spring of 2012 showing a reduction in traffic projections. It was also developed in consultation with resource agencies in regards to avoiding impacts to Yancey’s Tavern. After careful consideration, Alternative B Modified was selected as the Preferred Alternative because it meets the purpose and need of the project and was supported by the community. It improves safety while minimizing impacts to the environment and the community. The Preferred Alternative (Alternative B Modified) is the only alternative that does not have an adverse visual effect to Yancey’s Tavern or disturb known graves at the East Lawn Memorial Gardens Cemetery. It also has a lower total number of residential and business displacements and is supported by the mayors of Kingsport and Sullivan County.

## **1.4 Purpose and Need of the Proposed Action**

### **1.4.1 Purpose of the Proposed Action**

The purpose of the project is to provide a safe, efficient route for local traffic between the City of Kingsport and I-81 that achieves a reduction in crash rates, improvement of roadway deficiencies and improvement of access management to adjacent roadways and properties.

The proposed action is intended to address the following transportation needs in the study area:

- Improve roadway safety;
- Reduce the crash rate along the corridor;
- Improve roadway geometry and width deficiencies;
- Provide adequate roadway and shoulder widths for vehicles and;
- Improve access management and traffic operations.

Secondary goals include minimizing the roadway footprint, complementing the rural nature of the area, and improving pedestrian and bicycle connectivity.

### **1.4.2 Need for the Proposed Action**

#### **Improve Roadway Safety**

Safety needs have been recognized for this segment of SR 126 since the early 1990s. Safety was the subject of a resolution by the KMTPO in March 2003 requesting TDOT assistance, which led to the CSS process. Since that time, various safety studies were conducted and improvement projects have been completed, including the following:

- In August 2005, the CRT provided their recommendations for improving SR 126 to TDOT. The CSS process is summarized in Section 1.3 and detailed in the DEIS. Among the unanimous recommendations made by the CRT, safety was identified as the highest priority improvement for the project;
- Safety improvements recommended in a March 2006 Road Safety Audit Review (RSAR), which included paving, vegetation maintenance, restriping, pavement markings,



and signage, have been completed. The intersection of Carolina Pottery Drive/Overhill Drive with SR 126 had four times the crash rate as that of similar intersections;

- In December 2008, the KMTPO developed the Draft State Route 126/Memorial Boulevard (Sullivan County) Safety Improvements Project report. The report recommended major and minor improvements to be constructed. It also stated that many of the proposed safety improvements, such as intersection improvements and upgrading the S-curves on Chestnut Ridge, would become an integral part of the future final upgrade of the highway and;
- TDOT issued an additional RSAR in June 2009, which recommended safety improvements along the entire study corridor from East Center Street to I-81. The RSAR noted that the crash rate along the entire corridor was higher than the statewide average crash rate for similar roadway segments. It identified short-term safety solutions such as paving, restriping, signage, reflectors and pavement markers, vegetation maintenance, and guardrails that would correct critical areas of concern. The recommendations in the RSAR were completed in 2010.

Each of these studies are described in the DEIS. These studies and safety projects document the need for improvements along the study corridor. The past efforts to improve the safety of the roadway have involved relatively low cost improvements for spot locations along the route. However, the crash rate remains high and residents continue to have difficulty safely accessing adjacent roads, driveways and parking lots. A corridor-wide improvement is needed to adequately address the safety issues and roadway deficiencies of SR 126.

#### Reduce Crash Rate

A safety analysis was conducted along the SR 126 study corridor as part of project development. The analysis utilized TDOT's crash data from 2009 to 2011 and 2011 traffic volumes taken from the Tennessee Road Information Management System (TRIMS) database. From 2009 to 2011, a total of 337 crashes occurred along the SR 126 study corridor, including 92 non-incapacitating injury crashes, 11 incapacitating injury crashes, and zero fatal crashes. It should be noted that 2012 data was incomplete at the time of this analysis; however, it is known to contain one reported fatality near the intersection of Cassidy Drive.

The study corridor was divided into seven segments for the purpose of the crash analysis. A summary of the reported crashes and their calculated crash rate is provided in Table 1-2. Crash rates are reported in crashes per one million vehicle miles traveled for segments and crashes per one million vehicles entering the intersection. As shown in Table 1-2, the actual crash rate calculated for several segments along the study corridor exceed the statewide average crash rate for similar roadway segments. The ratio of the actual crash rate to the statewide critical crash rate (A/C Ratio) is also provided in the last column. An A/C Ratio in excess of 1.0 indicates a roadway segment that should be considered for safety improvements.

**TABLE 1-2: 2009-2011 CRASH RATE SUMMARY FOR SR 126**

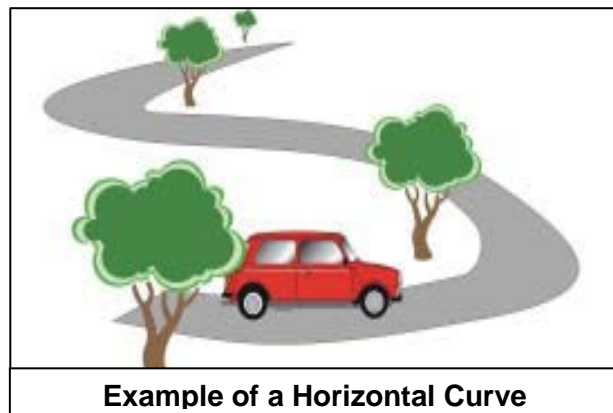
Section Limits or Intersection Location	Section	Crashes						
		Total	Non-Incapacitating Injury	Incapacitating Injury	Fatal	Actual Rate	Statewide Average Rate	A/C* Ratio
E. Center Street to Hillcrest Drive	4-Lane Undivided	45	7	0	0	4.261	3.216	0.94
Hillcrest Street to Stratford Road	4-Lane Divided	45	15	0	0	14.651	1.777	3.95
Stratford Road to Old Stage Road	2-Lane (w/ Truck Climbing Lane)	71	15	4	0	4.334	2.334	1.34
Old Stage Road to Cooks Valley Road	2-Lane	35	11	0	0	2.511	2.334	0.76
Cooks Valley Road to Harrtown Road	2-Lane	81	24	1	0	4.467	2.334	1.35
Harrtown Road to Overhill Road	2-Lane	24	7	1	0	1.714	2.334	0.52
SR 126 Intersection with Overhill Rd.	N/A (Intersection)	32	12	5	0	3.766	0.09	9.7

Sources: TDOT - Project Safety Office (2009-2011); (TRIMS) (2011) \*Excess of 1.0 indicates likely safety issue.

### Improve Roadway Deficiencies

The existing roadway features inadequate lane widths, a lack of shoulders, and a roadside with steep side-slopes and roadside hazards. Additionally, substandard horizontal and vertical curves were identified by the public and by the CRT as a major concern on SR 126. These concerns were considered during engineering field studies. Following is a summary of the identified deficiencies for horizontal and vertical curves and shoulder widths within the study area.

**Horizontal Curves:** Horizontal curves provide side to side movement, or bends, along the roadway. They are used to allow a roadway to fit within the terrain and environment along the roadway. Roadways that originated before modern design standards, such as SR 126, frequently have curves that do not allow motorists traveling at normal speeds to see sufficiently along the roadway to safely recognize and respond to objects present or entering the travel way. Buildings, vegetation, utilities, and other features adjacent to the roadway obscure the driver's line of sight as the roadway bends or curves along their direction of travel.

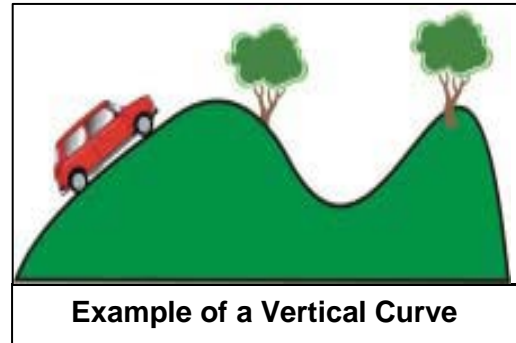


The speed at which a reasonable and prudent driver can safely navigate a curve is dependent on the amount of sight distance available as the driver moves along the curve. Based on TDOT design standards, this speed is recognized as the design speed of a curve based on its rate of



curvature and other criteria. TDOT designs roadways with design speeds equal to or greater than their anticipated posted speed limit. Approximately 41 percent (20 out of 49) of the horizontal curves along the study section of SR 126 do not meet TDOT design standards for their corresponding posted speed limit. The design speeds of these 20 curves based on their existing geometry are deficient by 10 mph to 25 mph when compared to their posted speed limit. To warn drivers of potentially unsafe conditions, eight horizontal curves are currently posted with advisory speed signs, which range from 10 to 15 mph below the posted speed limit.

**Vertical Curves:** Vertical curves provide the up and down movements along a roadway. These are needed to accommodate changes in terrain (hills and valleys) and to cross features such as roads, railroads, and bodies of water. The sight distance available to a driver to perceive and respond to a roadway hazard is dependent on the rate of curvature of the vertical curve and the driver's travel speed. A flatter curve allows a driver to see a greater distance, which will allow a higher safe travel speed.



Similar to horizontal curves, the speed at which a reasonable and prudent driver can safely navigate a vertical curve is dependent on the amount of sight distance available as the driver moves along the curve. Based on TDOT design standards, this speed is recognized as the design speed of a curve based on its rate of curvature and other criteria. Data from a controlled aerial survey was used to develop a centerline profile for the project area of SR 126. The curvature of the profile was examined to identify vertical curves that do not meet current design standards and are insufficient for sight distance for the posted speed limit. Forty-two vertical curves were identified as having a design speed less than the posted speed limit. Deficiencies in design speed compared to posted speed range from 5 mph to 30 mph. Eleven vertical curves have a deficiency of 15 mph or greater.

**Lane and Shoulder Widths:** Due to a lack of adequate shoulders accompanied by narrow lane widths in some segments, emergency vehicle response time is reduced within and near the project corridor. Wider shoulders are needed to allow adequate room for stalled vehicles to pull over, emergency vehicles to pass through to their intended destinations, and to allow mail delivery vehicles and buses to have sufficient pull-over space. These were needs identified by the CRT during the CSS process.

Field studies and review of aerial mapping was performed during the CSS process to identify existing lane and shoulder widths. These are tabulated in Chapter 2 for the No-Build Alternative. Eleven-foot lanes are predominant through most of the corridor. TDOT standards require a 12-foot lane width for a rural arterial with an ADT of 2,000 or greater. The existing roadway from near Harbor Chapel Road to Harr Town Road does not meet this standard. Shoulder widths vary from one-foot to eight-foot. For a two-lane rural arterial, TDOT standards require a minimum six-foot shoulder. Most of the roadway from Harbor Chapel Road to I-81 has deficient shoulder widths.

Improved shoulders will also meet the secondary goal of accommodating bicycles and pedestrians. A shoulder width equal to or greater than four feet is generally regarded as the minimum safe width for bicyclists. As summarized in the DEIS; only eight percent of the existing route provides adequate shoulder width to accommodate bicyclists.

### Improve Access Management

Entering and exiting business parking lots along SR 126 is a safety concern. This is due, primarily, to the existing lack of access control to businesses along the roadway. Some private drives and cross roads have excessive pavement and lack of channelization that allows uncontrolled traffic flow. Many of the access points are located near or within substandard curves or hills that limit sight distance for drivers attempting to turn into or out of the businesses. Some cross roads approach the highway at sharp angles and with poor approach grades that inhibit sight distance. The Preferred Alternative (Alternative B Modified) proposes to improve access management with intersection improvements, reconstruction of cross road approaches, and closure of selected access points.

## **1.5 Level of Service Analysis**

### **1.5.1 Traffic**

Traffic projections were initially created by TDOT during the CSS process to assist with determining the needed improvements. Traffic projections were updated for the base and design years of 2017 and 2037, respectively, following an update to the KMTPO Travel Demand Model in the spring of 2012. The updated model indicates lower traffic growth trends. This condition has created stagnant development in and around the zones that generate traffic on SR 126. Table 1-3 shows the traffic growth rate for specific locations along SR 126 in percentages.

The Base Year Traffic (2017) utilized four TDOT count stations within the study corridor, historical data within the study corridor, and calibrated turning movement counts. The Design Year Traffic (2037) was calculated utilizing four zones segmented by the TDOT count stations with respect to variances in growth rates provided from the KMTPO model. As shown in Table 1-3, the growth rates range from 0.08 percent and 1.75 percent.

**TABLE 1-3: TRAFFIC GROWTH RATES ALONG SR 126**

<b>Percent per year</b>	<b>Location</b>
1.33	East Center Street and Orebank Road
1.35	Orebank Road and SR 93 (John B. Dennis Highway)
1.33	SR 93 (John B. Dennis Highway) and Hawthorne Street
1.46	Hawthorne Street and Harbor Chapel Road
1.47	Harbor Chapel Road and Old Stage Road
1.75	Old Stage Road and Cooks Valley Road
1.45	Cooks Valley Road and Island Road
0.6	Island Road and Fall Creek Road
0.9	Fall Creek Road and Hill Road
0.5	Hill Road and Harrtown Road
0.08	Harrtown Road and I-81

*Source: TDOT-Planning Division (2012)*

The traffic volumes utilized for this study are listed in Table 1-4 and illustrated graphically in Figure 1-4. As can be seen in the Figure 1-4 graph, the traffic is heaviest at the western terminus of the study corridor, peaking in the SR 93 (John B. Dennis Highway) interchange area. The land use in this area is mixed commercial and residential. The traffic volumes gradually decrease until it reaches Cooks Valley Road. Cooks Valley Road is located just outside the Kingsport city limits in a residential area. The land use east from Cooks Valley Road



changes from residential to rural. East from Cooks Valley Road, the traffic volumes are lighter and continue to decrease until reaching the study corridor's eastern terminus at I-81.

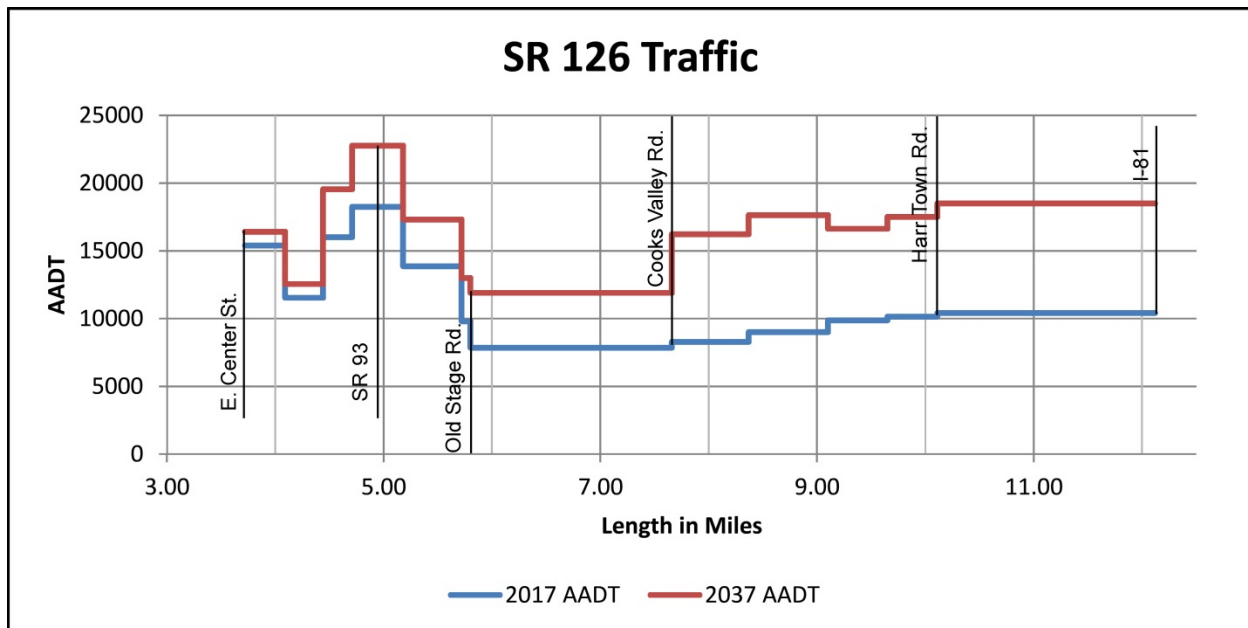
**TABLE 1-4: SR 126 TRAFFIC VOLUMES**

SR 126 Existing and Future Traffic Volumes			
From	To	2017 AADT	2037 AADT
Cross Road	Cross Road		
East Center Street	Orebank Road	15,390	16,410
Orebank Road	SR 93	11,530	12,540
SR 93	Hawthorne Street	16,000	19,550
Hawthorne Street	Harbor Chapel Road	18,240	22,760
Harbor Chapel Road	Briarwood Road	13,860	17,300
Briarwood Road	Old Stage Road	9,790	13,000
Old Stage Road	Cooks Valley Road	7,840	11,890
Cooks Valley Road	Island Road	8,280	16,230
Island Road	Fall Creek Road	9,000	17,640
Fall Creek Road	Hill Road	9,870	16,630
Hill Road	Harr Town Road	10,150	17,510
Harr Town Road	I-81	10,420	18,490

Note: AADT = Average Annual Daily Traffic.

Source: TDOT-Planning Division (2012).

**FIGURE 1-4: SR 126 TRAFFIC VOLUMES**



Source: TDOT-Planning Division (2012).

### 1.5.2 Capacity Analysis Results

Several measures of effectiveness (MOE) are utilized in this document to assess the operational conditions of SR 126 for the No-Build, Preferred Alternative (Alternative B Modified), Alternative A, and Alternative B. These MOEs are level of service, density, and average travel speed. A definition of these measures is provided in the following paragraphs. Analysis results for each MOE are based on the updated KMTPO Travel Demand Model (2012). A summary of the Level of Service MOE is provided for all alternatives in Table 1-6. Details for the No-Build and Preferred Alternative (Alternative B Modified) Design Year (2037) MOE are provided in Tables 1-7 and 1-8. A traffic analysis summary for Alternatives A and B is included in Appendix A.

#### Level of Service:

Level of Service (LOS) is a measure of quality that describes operational conditions within a traffic stream, generally in terms such as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. LOS ranges from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each LOS rating represents a range of operating conditions and the driver's perception of those conditions. Please refer to Table 1-5 for a description of each LOS.

The quality of service was assessed utilizing the methodology outlined in the *Highway Capacity Manual 2010* (HCM) Urban Street Segments, Two-Lane Highways, and Multilane Highways chapters. The LOS calculations were performed with the Highway Capacity Software (HCS 2010, version 6.41). HCS 2010 was developed and is maintained as an implementation of the HCM procedures. HCS 2010 calculations assign a LOS value along route segments with similar geometric and traffic characteristics.

#### Average Travel Speed:







Average travel speed is calculated in the LOS analysis. Speed is an important measure of congestion and the quality of the traffic service provided to the motorist.

#### Density and Congestion Reduction:

Unlike LOS, which is a qualitative measure, density is a quantitative measure. The density is reported to demonstrate the magnitude of congestion for the options included in this document. Density reports the number of vehicles occupying a lane along a roadway segment during a specific time.



**TABLE 1-5: LOS REFERENCE TABLE**

LOS	Traffic Flow Conditions	Representative Photo
A	Free flow operations. Vehicles are almost completely unimpeded in their ability to maneuver with the traffic stream. The general level of physical and psychological comfort provided to the driver is high.	
B	Reasonable free flow operations. The ability to maneuver within the traffic stream is slightly restricted, and the general level of physical and psychological comfort provided to the driver is still high.	
C	Flow with speeds at or near free flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more vigilance on the part of the driver. The driver notices an increase in tension.	
D	Speeds decline with increasing traffic. Freedom to maneuver within the traffic stream is noticeably limited. The driver experiences reduced physical and psychological comfort levels.	
E	The facility is at capacity. Operations are volatile because there are virtually no gaps in the traffic stream. There is little room to maneuver. The driver experiences poor levels of physical and psychological comfort.	
F	Breakdowns in traffic flow. The number of vehicles entering the highway section exceeds the capacity or ability of the highway to accommodate traffic. There is little room to maneuver. The driver experiences poor levels of physical and psychological comfort.	

**TABLE 1-6: LOS COMPARISON**

Segment	Alternative				Range
	No Build	Preferred (Alternative B Modified)	A	B	
	LOS	LOS	LOS	LOS	
1a	B	B	B	B	Center to SR 93
1b	C	B	B	B	SR 93 to Hawthorne
2a	B/B <sup>1</sup>	B	B	B	Hawthorne to Harbor Chapel
2b	A/B <sup>1</sup>	A	A	A	Harbor Chapel to Past Harbor Chapel
3	B	A/A <sup>1</sup>	A	A	Past Harbor Chapel to Past Old Stage
4	E	E	A	A	Past Old Stage to Lemay
5	E	E	A	E	Lemay to Cooks Valley
6	E	E	E	E	Cooks Valley to Island
7	E	E	E	E	Island to Fall Creek
8	E	E	E	E	Fall Creek to Hill
9	E	E	E	E	Hill to Harrtown
10	E	D	D	D	Harrtown to Carolina Pottery
11	A	A	A	A	Carolina Pottery to I-81

Source: ICA Engineering (2012)

<sup>1</sup>Analysis segment geometry is asymmetrical (two lanes eastbound and one lane westbound). LOS is given for both eastbound and westbound lanes, respectively.

Table 1-6 compares the LOS calculation results for all alternatives. Segments were defined for analysis based on geometric features of the various alternatives and changes in traffic volumes for the design year traffic projections. For this reason, the analysis segments differ from those summarized for alternatives in Chapter 2. Details for the traffic analysis for all alternatives are provided in Appendix A.

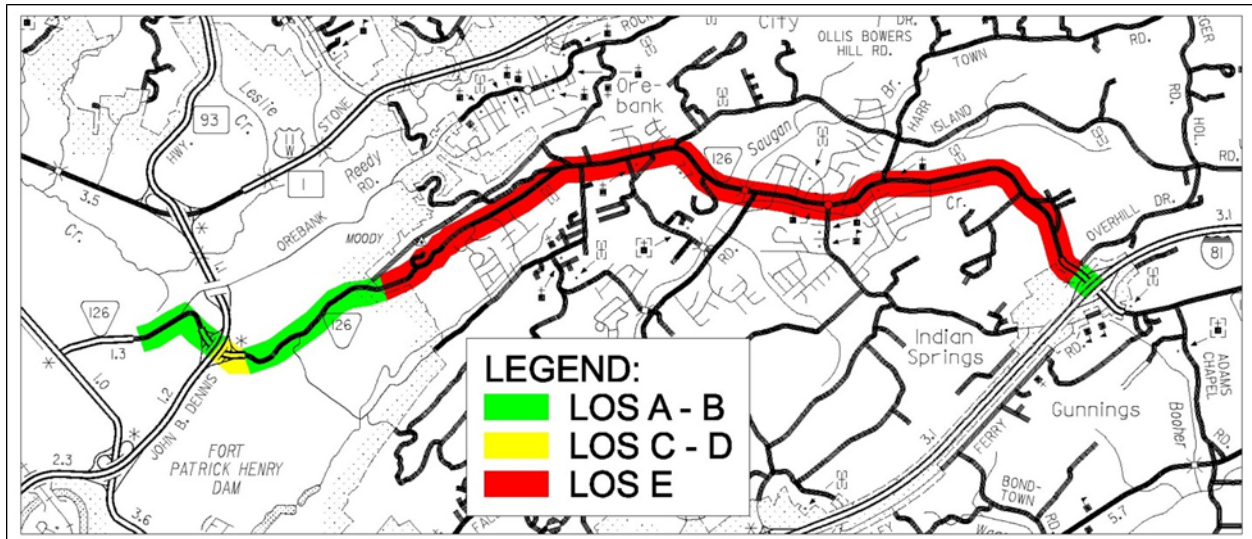
### No-Build Alternative MOE

The No-Build Alternative makes no improvements to SR 126 other than scheduled maintenance activities. The existing roadway characteristics of the No-Build Alternative are discussed in Chapter 2.

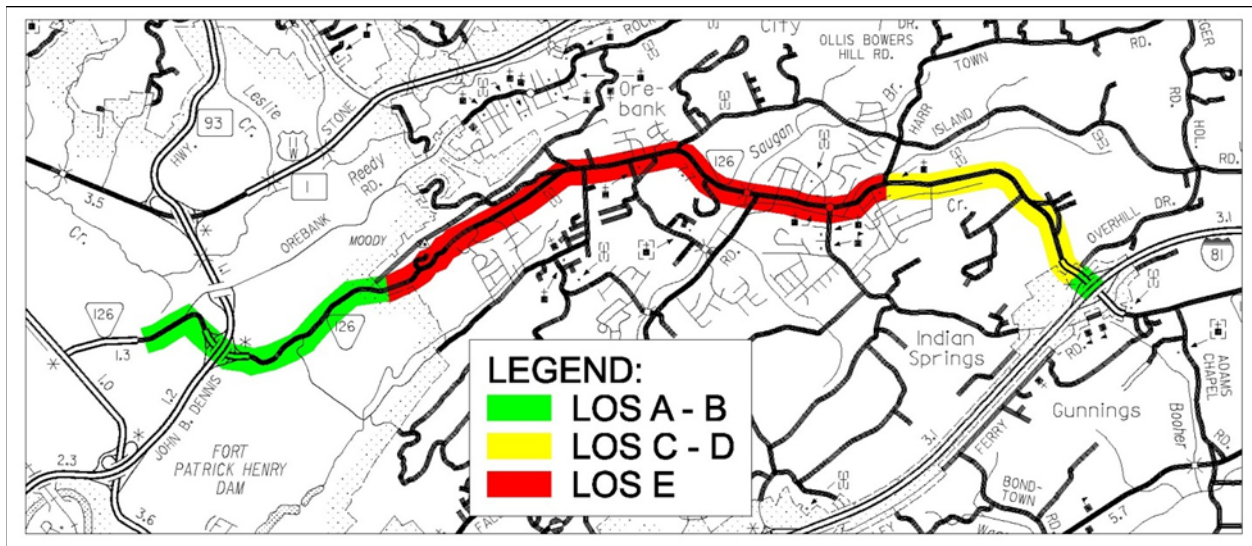
For the No-Build Alternative, the HCS analysis calculates LOS ratings ranging from A to E along SR 126 through the year 2037 during peak hour conditions. Seventy percent of the route is calculated to operate with a LOS of E by 2037. Results of the LOS calculations for the No-Build Alternative is provided in a summary graphic in Figure 1-5 and listed in Table 1-7. The LOS ratings are reported for the years 2017 and 2037.

The speed limit ranges from 35 to 45 mph along SR 126. For the No-Build Alternative in the year 2017, travel speeds along the corridor are calculated by the HCS to range from 25 mph to 45 mph, with a weighted average of 36 mph. In 2037, the travel speed ranges from 25 mph to 45 mph with a weighted average of 35 mph. The average was weighted based upon the length of each segment analyzed. The weighted average of the speed limit along the route is 44 mph. The calculated average route speed is 82 percent, and 80 percent of the posted speed limit in the years 2017 and 2037, respectively.

**FIGURE 1-5: SR 126 No-BUILD ALTERNATIVE DESIGN YEAR (2037) LOS**



**FIGURE 1-6: SR 126 PREFERRED ALTERNATIVE (ALTERNATIVE B MODIFIED) DESIGN YEAR (2037) LOS**





A summary of the travel speed calculations for the No-Build Alternative is provided in Table 1-7. The travel speeds are reported for the years 2017 and 2037.

For the No-Build Alternative in the year 2017, the density of SR 126 is calculated to range from 6.6 to 32.9 passenger cars per mile per lane (pc/mi/ln), with a weighted average of 18.6 pc/mi/ln. In 2037, the density ranges from 6.7 to 43.4 pc/mi/ln with a weighted average of 23.0. The average was weighted based upon the length of each segment analyzed. A summary of the density calculations for the No-Build Alternative is provided in Table 1-7. The densities are reported for the years 2017 and 2037.

#### Preferred Alternative (Alternative B Modified) MOE

For the Preferred Alternative (Alternative B Modified), the HCS analysis calculates LOS ratings ranging from A to E along SR 126 through the year 2037 during peak hour conditions. Forty-nine percent of the route is calculated to operate with a LOS of E by 2037. The results of the LOS calculations for the Preferred Alternative (Alternative B Modified) are provided in Table 1-8 and a summary graphic is provided in Figure 1-6. The LOS ratings are reported for the years 2017 and 2037.

The Preferred Alternative (Alternative B Modified) provides a LOS E from Old Stage Road to Cooks Valley Road. This is a reduced LOS compared to Alternatives A and B (see Table 1-6), which provide a LOS A for the projected traffic volumes through Lemay Drive and Cooks Valley Road, respectively. This is because Alternatives A and B extend four travel lanes through these limits, while the Preferred Alternative (Alternative B Modified) provides only two travel lanes. However, the improvements proposed by the Preferred Alternative (Alternative B Modified) were selected in this area because they improve safety and traffic operations while requiring less right-of-way acquisition of private property, displacements of residents, and impacts to Chestnut Ridge, including Yancey's Tavern and the East Lawn Memorial Gardens Cemetery. The Preferred Alternative (Alternative B Modified) will provide improved traffic operations when compared to the No-Build Alternative. While this is not reflected in the LOS values, it is revealed in review of other MOEs, such as travel speed and density, listed in Table 1-7 and Table 1-8.

The speed limit of the Preferred Alternative (Alternative B Modified) is expected to range from 35 to 50 mph along SR 126. For the Preferred Alternative (Alternative B Modified) in the year 2017, travel speeds along the corridor are calculated by the HCS to range from 30 mph to 50 mph, with a weighted average of 38 mph. In 2037, the travel speed ranges from 29 mph to 50 mph, but the weighted average decreases to 37 mph. The average was weighted based upon the length of each segment analyzed and represents a slight improvement over the No-Build Alternative. The weighted average of the proposed speed limit along the route is 44 mph. The calculated average route speed is 86 percent and 84 percent of the posted speed limit in the years 2017 and 2037, respectively. This represents a slight improvement over the No-Build Alternative. A summary of the travel speed calculations for the Preferred Alternative (Alternative B Modified) is provided in Table 1-8. The travel speeds are reported for the years 2017 and 2037.

Table 1-7: No-Build Alternative MOE

ID	From	To	Dist.	Cross Section	Speed Limit	2017				2037			
						AADT	LOS	Speed	Density	AADT	LOS	Speed	Density
1a	Center St.	SR 93	0.72	4-Lanes with No Median and Narrow Shoulders	35	14,680	B	32	16.5	18,580	B	31	21.2
1b	SR 93	Hawthorne St.	0.27	4-Lanes with a Raised Grass Median and Wide Shoulders	35	16,100	C	25	22.6	20,380	C	26	28.5
2a	Hawthorne St.	Harbor Chapel Rd.	0.47	2-Lanes Eastbound, 1-Lane Westbound with No Median and Narrow Shoulders	45	15,630	B	34	32.9	20,190	B	33	43.4
2b	Harbor Chapel Rd.	Past Harbor Chapel Rd.	0.34	2-Lanes Eastbound, 1-Lane Westbound with No Median and Narrow Shoulders	45	10,030	A	41	17.7	12,980	A	41	22.7
3	Past Harbor Chapel Rd.	Past Old Stage Rd.	0.5	2-Lanes with TWLTL and Narrow Shoulders	45	10,030	B	32	22.2	12,980	B	31	30.2
4	Past Old Stage Rd.	Lemay Rd.	1.2	2-Lanes with No Median and Narrow Shoulders	45	7,680	E	38	17.4	10,370	E	36	23.7
5	Lemay Rd.	Cooks Valley Rd.	0.44	2-Lanes with No Median and Narrow Shoulders	45	7,680	E	36	18.5	10,370	E	34	25.3
6	Cooks Valley Rd.	Island Rd.	0.71	2-Lanes with No Median and Narrow Shoulders	45	9,570	E	34	23.0	12,350	E	32	30.9
7	Island Rd.	Fall Creek Rd.	0.73	2-Lanes with No Median and Narrow Shoulders	45	7,510	E	36	18.1	8,410	E	35	20.1
8	Fall Creek Rd.	Hill Rd.	0.55	2-Lanes with No Median and Narrow Shoulders	45	8,440	E	35	20.1	9,960	E	34	24.4
9	Hill Rd.	Harrtown Rd.	0.47	2-Lanes with No Median and Narrow Shoulders	45	6,370	E	36	15.5	7,010	E	36	16.8
10	Harrtown Rd.	Carolina Pottery Rd.	1.8	2-Lanes with No Median and Narrow Shoulders	45	6,870	E	39	15.4	6,980	E	38	15.7
11	Carolina Pottery Rd.	I-81	0.2	4-Lanes with a Raised Grass Median and Wide Shoulders	40	6,870	A	45	6.6	6,980	A	45	6.7
<b>Σ =</b>			<b>8.4</b>	<b>Weighted Average =</b>	<b>44</b>			<b>36</b>	<b>18.6</b>			<b>35</b>	<b>23.0</b>

Source: TDOT-Planning (2012), ICA Engineering 2012.

**TABLE 1-8: PREFERRED ALTERNATIVE (ALTERNATIVE B MODIFIED) MOE**

ID	To	From	Dist.	Cross Section	Speed Limit	2017				2037			
						AADT	LOS	Speed	Density	AADT	LOS	Speed	Density
1a	Center St.	SR 93	0.72	4-Lanes with a Raised Grass Median and 4 Ft. Shoulders	35	14,680	B	31	17.2	18,580	B	30	22.4
1b	SR 93	Hawthorne St.	0.27	4-Lanes with a Raised Grass Median and 4 Ft. Shoulders	35	16,100	B	30	19.4	20,380	B	29	25.3
2	Hawthorne St.	Harbor Chapel Rd.	0.47	4-Lanes with a TWLTL and 4 Ft. Shoulders	35	15,630	A	35	15.8	20,190	B	35	20.6
3	Harbor Chapel Rd.	Past Old Stage Rd.	0.84	2-Lanes w/ EB Truck Climbing Lane and 10 Ft. Shoulders	45	10,030	A	40	9.0	12,980	A	40	11.7
4	Past Old Stage Rd.	Past Lemay Rd.	1.2	2-Lanes with a TWLTL and 6 Ft. Shoulders	45	7,680	D	40	16.3	10,370	E	38	22.1
5	Past Lemay Rd.	Cooks Valley Rd.	0.44	2-Lanes with a TWLTL and 6 Ft. Shoulders	45	7,680	E	38	17.2	10,370	E	36	23.5
6	Cooks Valley Rd.	Island Rd.	0.71	2-Lanes with a TWLTL and 6 Ft. Shoulders	45	9,570	E	37	21.4	12,350	E	35	28.6
7	Island Rd.	Fall Creek Rd.	0.73	2-Lanes with a TWLTL and 6 Ft. Shoulders	45	7,510	E	38	17.0	8,410	E	37	19.0
8	Fall Creek Rd.	Hill Rd.	0.55	2-Lanes with a TWLTL and 6 Ft. Shoulders	45	8,440	E	38	18.8	9,960	E	36	22.7
9	Hill Rd.	Harrtown Rd.	0.47	2-Lanes with a TWLTL and 6 Ft. Shoulders	45	6,370	E	39	14.5	7,010	E	39	15.7
10	Harrtown Rd.	Carolina Pottery Rd.	1.8	2-Lanes with No Median and 10 Ft. Shoulders	45	6,870	D	41	14.5	6,980	D	41	14.7
11	Carolina Pottery Rd.	I-81	0.2	4-Lanes with a Raised Grass Median and 12 Ft. Shoulders	45	6,870	A	50	5.9	6,980	A	50	6.0
<b>Σ =</b>			<b>8.40</b>	<b>Weighted Average =</b>	<b>43</b>			<b>38</b>	<b>15.7</b>			<b>37</b>	<b>19.2</b>

Source: TDOT-Planning Division (2012), ICA Engineering 2012.



For the Preferred Alternative (Alternative B Modified) in the year 2017, the density of SR 126 is calculated to range from 5.9 to 21.4 passenger cars pc/mi/ln, with a weighted average of 15.7 pc/mi/ln. In 2037, the density ranges from 6.0 to 28.6 pc/mi/ln with a weighted average of 19.2 pc/mi/ln. The average was weighted based upon the length of each segment analyzed and represents an improvement compared to 23.0 pc/mi/ln as calculated for the No-Build Alternative. A summary of the density calculations for the Preferred Alternative (Alternative B Modified) is provided in Table 1-8. The densities are reported for the years 2017 and 2037.

The two travel lane improvements proposed for the Preferred Alternative (Alternative B Modified) differ from the four-lane improvements proposed for Alternatives A and B along the segment from Old Stage Road to Lemay Drive and Cooks Valley Road, respectively. As expected, traffic density will be greater for the Preferred Alternative (Alternative B Modified) in this segment when compared to the other build alternatives. However, the Preferred Alternative (Alternative B Modified) presents an improved density MOE in relation to the existing conditions of the No-Build Alternative while providing improved safety with less impact to properties, residents, and the environment along this segment.

#### Alternatives A and B MOE

For Alternatives A and B, the HCS analysis calculates LOS ratings ranging from A to E along SR 126 through the year 2037 during peak hour conditions. As shown in Table 1-6, the only differences in LOS for these alternatives, when compared to the Preferred Alternative (Alternative B Modified), are the segments from Harbor Chapel Road to Cooks Valley Road. Alternative A extends the proposed four-lane section to Cooks Valley Road and Alternative B extends the four-lane section to Lemay Drive. For this reason, they present a LOS A through their respective four-lane limits compared to a LOS E for the three-lane section proposed by the Preferred Alternative (Alternative B Modified). Thirty percent of the route is calculated to operate with a LOS of E by 2037 for Alternative A and 35 percent of the route is a LOS E with Alternative B. A summary of the LOS calculations for these alternatives is provided graphically in Figure 1-7 and Figure 1-8, while the calculations are provided in Table 1-9 and Table 1-10.

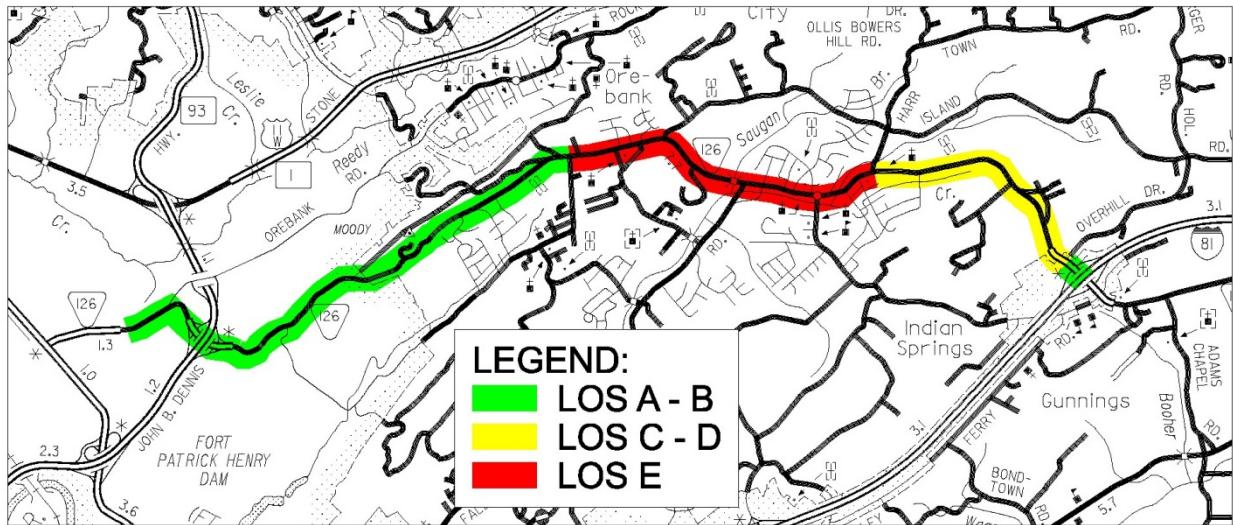
The speed limit of the corridor is expected to range from 35 to 50 mph along SR 126. For Alternatives A and B in the year 2037, the travel speed ranges from 29 mph to 50 mph with a weighted average of 40 mph and 39 mph, respectively. The weighted average of the proposed speed limit along the route is 44 mph. Therefore, the calculated average travel speed is 91 percent of the posted speed limit for Alternative A and 89 percent for Alternative B in the year 2037. The results of the travel speed calculations for these alternatives are provided in Table 1-9 and Table 1-10.

For Alternative A in the year 2037, the density of SR 126 is calculated to range from 9.0 to 29.0 passenger cars pc/mi/ln, with a weighted average of 16.6 pc/mi/ln. For Alternative B, the density ranges from 9.0 to 29.0 pc/mi/ln with a weighted average of 17.4 pc/mi/ln. The results of the density calculations for these alternatives are provided in Table 1-9 and Table 1-10.

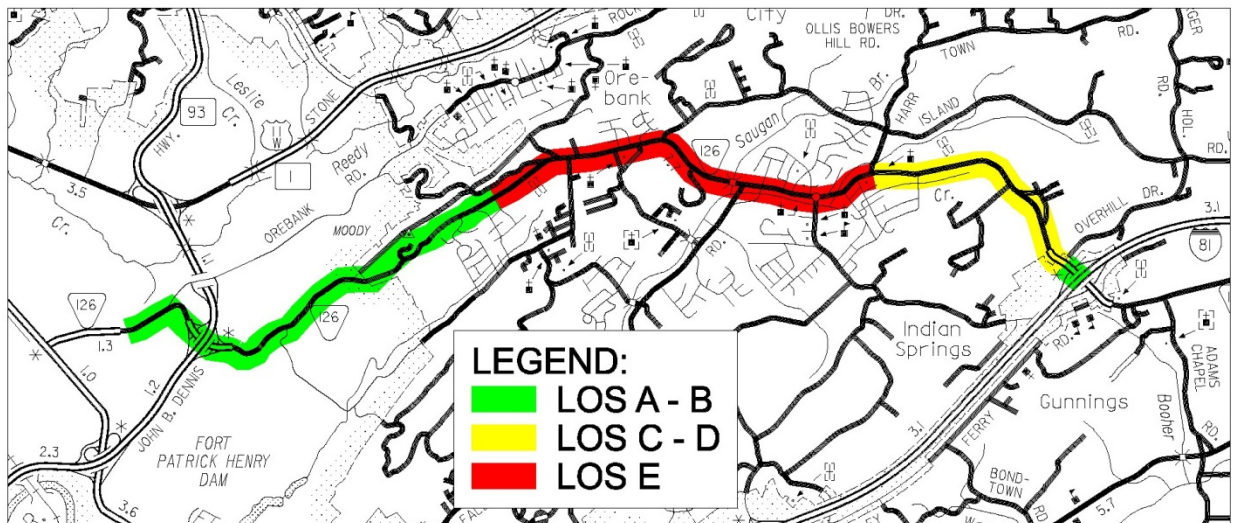
For each MOE discussed, the values calculated for Alternative A and Alternative B represent small improvements over the same MOE calculated for the No-Build Alternative and the Preferred Alternative (Alternative B Modified). This is expected when considering the only difference related to traffic capacity between the build alternatives is the extent of the proposed four-lane cross-section. The extended four-lane sections of Alternatives A and B would provide a higher traffic capacity between Harbor Chapel and Cooks Valley Road. However, the improvements proposed by the Preferred Alternative (Alternative B Modified) were selected in this area because they improve safety and traffic operations compared to the No-Build Alternative while requiring less ROW acquisition of private property, displacements of residents,

and impacts to Chestnut Ridge, including Yancey's Tavern and the East Lawn Memorial Gardens Cemetery, when compared to Alternatives A and B.

**FIGURE 1-7: SR 126 ALTERNATIVE A DESIGN YEAR (2037) LOS**



**FIGURE 1-8: SR 126 ALTERNATIVE B DESIGN YEAR (2037) LOS**



**TABLE 1-9: ALTERNATIVE A MOE**

ID	From	To	Dist.	Cross Section	Speed Limit	2017				2037			
						AADT	LOS	Speed	Density	AADT	LOS	Speed	Density
1a	Center St.	SR 93	0.72	4-Lanes with a Raised Grass Median and 4 Ft. Shoulders	35	14,680	B	31	17.2	18,580	B	30	22.4
1b	SR 93	Hawthorne St.	0.27	4-Lanes with a Raised Grass Median and 4 Ft. Shoulders	35	16,100	B	30	19.4	20,380	B	29	25.3
2	Hawthorne St.	Harbor Chapel Rd.	0.47	4-Lanes with a TWLTL and 4 Ft. Shoulders	35	15,630	A	35	15.8	20,190	B	35	20.6
3	Harbor Chapel Rd.	Past Old Stage Rd.	0.84	4-Lanes with a Raised Grass Median and 4 Ft. Shoulders	45	10,030	A	41	8.8	12,980	A	40	11.6
4	Past Old Stage Rd.	Past Lemay Rd.	1.2	4-Lanes with a Raised Grass Median and 8 Ft. Shoulders	45	7,680	A	50	6.7	10,370	A	50	9.0
5	Past Lemay Rd.	Cooks Valley Rd.	0.44	4-Lanes with a Raised Grass Median and 8 Ft. Shoulders	45	7,680	A	45	7.4	10,370	A	45	10.0
6	Cooks Valley Rd.	Island Rd.	0.71	2-Lanes with a TWLTL and 6 Ft. Shoulders	45	9,570	E	37	21.4	12,350	E	34	29.0
7	Island Rd.	Fall Creek Rd.	0.73	2-Lanes with a TWLTL and 6 Ft. Shoulders	45	7,510	E	38	17.0	8,410	E	37	19.0
8	Fall Creek Rd.	Hill Rd.	0.55	2-Lanes with a TWLTL and 6 Ft. Shoulders	45	8,440	E	38	18.8	9,960	E	36	23.0
9	Hill Rd.	Harrtown Rd.	0.47	2-Lanes with a TWLTL and 6 Ft. Shoulders	45	6,370	E	39	14.5	7,010	E	38	15.8
10	Harrtown Rd.	Carolina Pottery Rd.	1.8	2-Lanes with No Median and 10 Ft. Shoulders	45	6,870	D	41	14.5	6,980	D	41	14.7
11	Carolina Pottery Rd.	I-81	0.2	4-Lanes with a Raised Grass Median and 12 Ft. Shoulders	45	6,870	A	50	5.9	6,980	A	50	6.0
			<b>Σ =</b>	<b>8.4</b>	<b>Weighted Average =</b>	<b>43</b>		<b>40</b>	<b>13.77</b>			<b>40</b>	<b>16.6</b>

Source: TDOT-Planning Division (2012), ICA Engineering 2012.



**TABLE 1-10: ALTERNATIVE B MOE**

ID	From	To	Dist.	Cross Section	Speed Limit	2017				2037			
						AADT	LOS	Speed	Density	AADT	LOS	Speed	Density
1a	Center St.	SR 93	0.72	4-Lanes with a Raised Grass Median and 4 Ft. Shoulders	35	14,680	B	31	17.2	18,580	B	30	22.4
1b	SR 93	Hawthorne St.	0.27	4-Lanes with a Raised Grass Median and 4 Ft. Shoulders	35	16,100	B	30	19.4	20,380	B	29	25.3
2	Hawthorne St.	Harbor Chapel Rd.	0.47	4-Lanes with a TWLTL and 4 Ft. Shoulders	35	15,630	A	35	15.8	20,190	B	35	20.6
3	Harbor Chapel Rd.	Past Old Stage Rd.	0.84	4-Lanes with a Raised Grass Median and 4 Ft. Shoulders	45	10,030	A	41	8.8	12,980	A	40	11.6
4	Past Old Stage Rd.	Past Lemay Rd.	1.2	4-Lanes with a Raised Grass Median and 8 Ft. Shoulders	45	7,680	A	50	6.7	10,370	A	50	9.0
5	Past Lemay Rd.	Cooks Valley Rd.	0.44	2-Lanes with a TWLTL and 6 Ft. Shoulders	45	7,680	E	38	17.2	10,370	E	36	23.7
6	Cooks Valley Rd.	Island Rd.	0.71	2-Lanes with a TWLTL and 6 Ft. Shoulders	45	9,570	E	37	21.4	12,350	E	34	29.0
7	Island Rd.	Fall Creek Rd.	0.73	2-Lanes with a TWLTL and 6 Ft. Shoulders	45	7,510	E	38	17.0	8,410	E	37	19.0
8	Fall Creek Rd.	Hill Rd.	0.55	2-Lanes with a TWLTL and 6 Ft. Shoulders	45	8,440	E	38	18.8	9,960	E	36	23.0
9	Hill Rd.	Harrtown Rd.	0.47	2-Lanes with a TWLTL and 6 Ft. Shoulders	45	6,370	E	39	14.5	7,010	E	38	15.8
10	Harrtown Rd.	Carolina Pottery Rd.	1.8	2-Lanes with No Median and 10 Ft. Shoulders	45	6,870	D	41	14.5	6,980	D	41	14.7
11	Carolina Pottery Rd.	I-81	0.2	4-Lanes with a Raised Grass Median and 12 Ft. Shoulders	45	6,870	A	50	5.9	6,980	A	50	6.0
			<b>Σ =</b>	<b>8.4</b>	<b>Weighted Average =</b>	<b>43</b>		<b>40</b>	<b>13.77</b>			<b>40</b>	<b>16.6</b>

Source: TDOT-Planning Division (2012), ICA Engineering 2012.

## **1.6 Consistency with Existing Transportation Plans**

The project is included in the KMTPO *Transportation Improvement Program* (TIP), for fiscal years 2014 through 2017, adopted December 19, 2013. The project limits from Center Street to I-81 are covered by Project TN-5 (PIN 105467.00) as listed in Section A, *Previous Projects – Status Report* on page 18 of the TIP. Phase 1, from East Center Street in Kingsport to Cook's Valley Road, is in the TIP as TN-5 (PIN 105467.01) with funding through the ROW phase in 2016. This information is included as Attachment A.

This project is included in the KMTPO's 2035 LRTP, dated June 7, 2012. The plan addresses the future transportation needs within the KMTPO boundary. The project is divided into three segments and is listed in the LRTP as PIN 105467.00, 8-TC, and 36-TSTI.

## **1.7 Logical Termini and Independent Utility**

The project begins at the intersection of East Center Street and a previously-improved section of SR 126. This intersection is the convergence of East Center Street, a local collector that provides direct access to the Kingsport Central Business District and SR 126, which has already been improved west of this intersection; and two other local roads – Miller Street and Warpath Drive. The project ends at I-81.

The project has logical termini because of its connection to the previously-improved section of SR 126 and to I-81. It also provides a connection to two state roadways – SR 36 and SR 93, which are located within the city limits of Kingsport. The project is of sufficient length to address environmental matters on broad scope.

The Preferred Alternative (Alternative B Modified) demonstrates independent utility because it is not dependent upon the development of any other transportation projects. The project would not restrict consideration of alternatives to other reasonably foreseeable transportation improvements.

## **1.8 Summary**

TDOT has determined the need for this proposed project based on the documented safety issues, geometric deficiencies, unacceptable crash rates, and unmanaged access to businesses, adjacent roads and driveways presented in this chapter.

The project has logical termini, is of sufficient length to address environmental matters on a broad scope, has independent utility, and will not restrict consideration of alternatives for other foreseeable transportation improvements.